

AMENDMENTS TO THE CLAIMS

Claims 1-5. (Cancelled)

6. (New) A process for preparing butadiene from n-butane comprising:

- A) providing a feed gas stream a comprising n-butane;
- B) feeding the feed gas stream a comprising n-butane into at least one first dehydrogenation zone and nonoxidatively catalytically dehydrogenating n-butane to obtain a product gas stream b comprising n-butane, 1-butene, 2-butene, butadiene, hydrogen, low-boiling secondary constituents and in some cases steam;
- C) feeding the product gas stream b of the nonoxidative catalytic dehydrogenation and an oxygenous gas into at least one second dehydrogenation zone and oxidatively dehydrogenating 1-butene and 2-butene to obtain a product gas stream c comprising n-butane, 2-butene, butadiene, hydrogen, low-boiling secondary constituents and steam, said product gas stream c having a higher content of butadiene than the product gas stream b;
- D) removing hydrogen, the low-boiling secondary constituents and steam to obtain a C₄ product gas stream d substantially consisting of n-butane, 2-butene and butadiene;
- E) separating the C₄ product gas stream d into a recycle stream e1 consisting substantially of n-butane and 2-butene and a stream e2 consisting substantially of butadiene by extractively distilling and recycling the stream e1 into the first dehydrogenation zone;

- F) optionally, feeding some or all of the stream e2 consisting substantially of butadiene into a selective hydrogenation zone and selectively hydrogenating butadiene to 1- and/or 2-butene to obtain a stream f comprising 1-butene and 2-butene;
- G) optionally, when F is carried out, feeding the stream f comprising 1-butene and 2-butene into a distillation zone and removing a product of value stream g1 consisting substantially of 1-butene to leave a stream g2 comprising 2-butene;
- H) optionally, when F and G are carried out, recycling the stream g2 comprising 2-butene into the first dehydrogenation zone.

7. (New) The process according to claim 6, wherein the noncatalytic dehydrogenation of n-butane is carried out autothermally.

8. (New) The process according to claim 6, wherein the feed stream a containing n-butane is obtained from liquefied petroleum gas (LPG).

9. (New) The process according to claim 6, wherein the extractive distillation is carried out using N-methylpyrrolidone as an extractant.

10. (New) The process according to claim 6, wherein F) and G) are carried out.

11. (New) The process according to claim 6, wherein F), G) and H) are carried out.